

region of a segment of vaccinia virus DNA otherwise co-linear with portions of the vaccinia virus genome such that DNA from a non-essential region of vaccinia virus is flanking said donor DNA, and whereby when incorporated into vaccinia virus by *in vivo* recombination expression of the donor DNA is under vaccinia control.

34. The plasmid of claim 33 wherein the donor DNA comprises a herpes simplex virus TK gene.

35. The plasmid of claim 33 wherein the segment of vaccinia virus DNA otherwise co-linear with portions of the vaccinia virus genome is the HindIII F-fragment of the vaccinia virus genome.

36. The plasmid of claim 35 wherein for expression there is a promoter within the F-fragment.

37. The plasmid of claim 36 wherein the donor DNA comprises a BamHI TK gene of herpes simplex virus.

38. The plasmid of claim 34 wherein the segment of vaccinia virus DNA otherwise co-linear with portions of the vaccinia virus genome is the AvaI H-fragment of the vaccinia virus genome.

39. The plasmid of claim 35 which is pDP137.

40. The plasmid of claim 38 which is pDP202^{TK/E}_K

41. The plasmid of claim 33 wherein the polypeptide is an antigen.

42. A recombinant vaccinia virus comprising donor DNA not naturally occurring in vaccinia virus encoding a polypeptide

foreign to vaccinia virus and a promoter operably linked to the donor DNA, and, which exerts functional control over the donor DNA, said donor DNA present within a non-essential region of a segment of vaccinia virus DNA otherwise co-linear with portions of the vaccinia virus genome such that the donor DNA is positioned within a non-essential region of the recombinant vaccinia virus, and, wherein there is expression of the donor DNA under vaccinia control.

43. The recombinant vaccinia virus of claim 42 wherein the donor DNA comprises a herpes simplex virus TK gene.

44. The recombinant vaccinia virus of claim 42 wherein the segment of vaccinia virus DNA otherwise co-linear with portions of the vaccinia virus genome is the HindIII F-fragment of the vaccinia virus genome.

45. The recombinant vaccinia virus of claim 44 wherein the promoter is within the F-fragment.

46. The recombinant vaccinia virus of claim 45 wherein the donor DNA comprises a BamHI TK gene of herpes simplex virus.

47. The recombinant vaccinia virus of claim 43 wherein the segment of vaccinia virus DNA otherwise co-linear with portions of the vaccinia virus genome is the AvaI H-fragment of the vaccinia genome.

48. The recombinant vaccinia virus of claim 44 which is vP2, vP4 or vP6.

49. The recombinant vaccinia virus of claim 47 which is vP22.